

AMENDMENTS TO THE CLAIMS

Claim 1 (Previously presented) An extrusion-free wet cleaning
5 process for post-etch Cu-dual damascene structures, the process
comprising:

10 providing a wafer comprising a silicon substrate and at least
one post-etch Cu-dual damascene structure, the post-etch
Cu-dual damascene structure having a via structure exposing
a portion of a Cu wiring line electrically connected with
an N⁺ diffusion region of the silicon substrate and a trench
structure formed on the via structure;

15 executing an oxidation step by applying a diluted H₂O₂ solution
to the wafer to slightly oxidize the surface of the exposed
Cu wiring line; and

washing away cupric oxide generated in the oxidation step
by means of a cupric oxide cleaning solution containing
diluted HF, NH₄F or NH₂OH having a pH of above 7.

20 Claim 2 (Original) The process of claim 1 wherein the Cu wiring
line electrically connected with an N⁺ diffusion region of
the silicon substrate serves as a cathode in the cupric oxide
cleaning solution.

25 Claim 3 (Original) The process of claim 1 wherein the method of
preventing Cu reduction reactions on the Cu wiring line
comprises purging inert gas onto the wafer during the
application to the wafer of the diluted H₂O₂ solution.

30 Claim 4 (Original) The process of claim 1 wherein the method of

preventing Cu reduction reactions on the Cu wiring line comprises adding a Cu corrosion inhibitor to the diluted H₂O₂ solution.

5 Claim 5 (Original) The process of claim 4 wherein the Cu corrosion inhibitor comprises benzotriazole (BTA).

10 Claim 6 (Previously presented) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises reducing the H₂O₂ concentration of the diluted H₂O₂ solution to below 100:1 (v/v) of solvent to H₂O₂.

15 Claim 7 (Original) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises lowering the temperature of the diluted H₂O₂ solution to below 15°C during the application to the wafer of the diluted H₂O₂ solution.

Claims 8-19 (Cancelled)

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